

SEQUENCE LISTING

<110> Genentech, Inc.
 FUNG, Sek Chung
 SINGH, Sanjaya
 HUANG, Dan
 Moyle, Matthew
 LU, Mason
 YAN, Changning

<120> Anti-IL13 Antibodies and Uses Thereof

<130> 12279-187-999

<140> 10/583,927

<141> 2009-01-29

<150> 60/532,130

<151> 2003-12-23

<160> 193

<170> PatentIn version 3.2

<210> 1

<211> 114

<212> PRT

<213> Homo sapiens

<400> 1

Ser Pro Gly Pro Val Pro Pro Ser Thr Ala Leu Arg Glu Leu Ile Glu
 1 5 10 15

Glu Leu Val Asn Ile Thr Gln Asn Gln Lys Ala Pro Leu Cys Asn Gly
 20 25 30

Ser Met Val Trp Ser Ile Asn Leu Thr Ala Gly Met Tyr Cys Ala Ala
 35 40 45

Leu Glu Ser Leu Ile Asn Val Ser Gly Cys Ser Ala Ile Glu Lys Thr
 50 55 60

Gln Arg Met Leu Ser Gly Phe Cys Pro His Lys Val Ser Ala Gly Gln
 65 70 75 80

Phe Ser Ser Leu His Val Arg Asp Thr Lys Ile Glu Val Ala Gln Phe
 85 90 95

Val Lys Asp Leu Leu Leu His Leu Lys Lys Leu Phe Arg Glu Gly Arg
 100 105 110

Phe Asn

<210> 2
<211> 114
<212> PRT
<213> Homo sapiens

<220>
<221> misc_feature
<222> (13)..(13)
<223> Xaa can be any naturally occurring amino acid

<400> 2

Ser Pro Gly Pro Val Pro Pro Ser Thr Ala Leu Arg Xaa Leu Ile Glu
1 5 10 15

Glu Leu Val Asn Ile Thr Gln Asn Gln Lys Ala Pro Leu Cys Asn Gly
20 25 30

Ser Met Val Trp Ser Ile Asn Leu Thr Ala Gly Met Tyr Cys Ala Ala
35 40 45

Leu Glu Ser Leu Ile Asn Val Ser Gly Cys Ser Ala Ile Glu Lys Thr
50 55 60

Gln Arg Met Leu Ser Gly Phe Cys Pro His Lys Val Ser Ala Gly Gln
65 70 75 80

Phe Ser Ser Leu His Val Arg Asp Thr Lys Ile Glu Val Ala Gln Phe
85 90 95

Val Lys Asp Leu Leu Leu His Leu Lys Lys Leu Phe Arg Glu Gly Arg
100 105 110

Phe Asn

<210> 3
<211> 113
<212> PRT
<213> Murinae gen. sp.

<220>
<221> CHAIN
<222> (1)..(113)
<223> VARIABLE REGION OF LIGHT CHAIN OF MONOCLONAL ANTIBODY 228B/C

<400> 3

Asn Ile Val Leu Thr Gln Ser Pro Ala Ser Leu Ala Val Ser Leu Gly
1 5 10 15

Gln Arg Ala Thr Ile Ser Cys Arg Ala Ser Lys Ser Val Asp Ser Tyr
 20 25 30

Gly Asn Ser Phe Met His Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro
 35 40 45

Lys Leu Leu Ile Tyr Leu Ala Ser Asn Leu Glu Ser Gly Val Pro Ala
 50 55 60

Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr Leu Thr Ile Asp
 65 70 75 80

Pro Val Glu Ala Asp Asp Ala Ala Ser Tyr Tyr Cys Gln Gln Asn Asn
 85 90 95

Glu Asp Pro Arg Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
 100 105 110

Ala

<210> 4
 <211> 118
 <212> PRT
 <213> Murinae gen. sp.

<220>
 <221> CHAIN
 <222> (1)..(118)
 <223> VARIABLE REGION OF HEAVY CHAIN OF MONOCLONAL ANTIBODY 228B/C

<400> 4

Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu Val Ala Pro Ser Gln
 1 5 10 15

Ser Leu Ser Ile Thr Cys Thr Val Ser Gly Phe Ser Leu Asn Ala Tyr
 20 25 30

Ser Val Asn Trp Val Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Leu
 35 40 45

Gly Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys
 50 55 60

Ser Arg Leu Asn Ile Ser Lys Asp Ser Ser Lys Ser Gln Val Phe Leu
 65 70 75 80

Lys Met Ser Ser Leu Gln Ser Asp Asp Thr Ala Arg Tyr Tyr Cys Ala
85 90 95

Gly Asp Gly Tyr Tyr Pro Tyr Ala Met Asp Asn Trp Gly His Gly Thr
100 105 110

Ser Val Thr Val Ser Ser
115

<210> 5
<211> 118
<212> PRT
<213> Murinae gen. sp.

<220>
<221> CHAIN
<222> (1)..(118)
<223> VARIABLE REGION OF LIGHT CHAIN OF MONOCLONAL ANTIBODY 228A-4

<400> 5

Gln Val Gln Leu Lys Glu Ser Gly Pro Gly Leu Val Ala Pro Ser Gln
1 5 10 15

Ser Leu Ser Ile Thr Cys Thr Val Ser Gly Phe Ser Leu Thr Asp Tyr
20 25 30

Asn Ile Asn Trp Ile Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Leu
35 40 45

Gly Met Ile Trp Gly Asp Gly Ser Thr Ala Tyr Asn Ser Ala Leu Lys
50 55 60

Ser Arg Leu Ser Ile Ser Lys Asp Asn Ser Lys Ser Gln Ile Phe Leu
65 70 75 80

Lys Met Asn Ser Leu Gln Thr Glu Asp Thr Ala Arg Tyr Tyr Cys Ala
85 90 95

Arg Asp Gly Tyr Phe Pro Tyr Ala Met Ala Tyr Trp Gly Gln Gly Thr
100 105 110

Ser Val Thr Val Ser Ser
115

<210> 6
<211> 118
<212> PRT
<213> Murinae gen. sp.

<220>
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 <222> (1)..(118)
 <223> VARIABLE REGION OF HEAVY CHAIN OF MONOCLONAL ANTIBODY 228A-4
 <400> 6

Gln Val Gln Leu Lys Glu Ser Gly Pro Gly Leu Val Ala Pro Ser Gln
 1 5 10 15

Ser Leu Ser Ile Thr Cys Thr Val Ser Gly Phe Ser Leu Thr Asp Tyr
 20 25 30

Asn Ile Asn Trp Ile Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Leu
 35 40 45

Gly Met Ile Trp Gly Asp Gly Ser Thr Ala Tyr Asn Ser Ala Leu Lys
 50 55 60

Ser Arg Leu Ser Ile Ser Lys Asp Asn Ser Lys Ser Gln Ile Phe Leu
 65 70 75 80

Lys Met Asn Ser Leu Gln Thr Glu Asp Thr Ala Arg Tyr Tyr Cys Ala
 85 90 95

Arg Asp Gly Tyr Phe Pro Tyr Ala Met Ala Tyr Trp Gly Gln Gly Thr
 100 105 110

Ser Val Thr Val Ser Ser
 115

<210> 7
 <211> 114
 <212> PRT
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<220>
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 <222> (1)..(114)
 <223> VARIABLE REGION OF LIGHT CHAIN OF MONOCLONAL ANTIBODY 227-26

<220>
 <221> CHAIN
 <222> (1)..(114)
 <223> VARIABLE REGION OF LIGHT CHAIN OF MONOCLONAL ANTIBODY 227-26-1

<400> 7

Asp Val Leu Met Thr Gln Thr Pro Leu Ser Leu Pro Val Ser Leu Gly
 1 5 10 15

Asp Gln Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Ile Val His Ser
 20 25 30

Asn Gly Asn Thr Tyr Leu Gln Trp Tyr Leu Gln Lys Pro Gly Gln Ser
 35 40 45

Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
 50 55 60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
 65 70 75 80

Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Tyr Cys Phe Gln Gly
 85 90 95

Ser His Val Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
 100 105 110

Arg Ala

<210> 8
 <211> 120
 <212> PRT
 <213> Murinae gen. sp.

<220>
 <221> CHAIN
 <222> (1)..(120)
 <223> VARIABLE REGION OF HEAVY CHAIN OF MONOCLONAL ANTIBODY 227-26-1

<400> 8

Gln Val Gln Leu Gln Gln Ser Gly Asp Asp Leu Val Leu Pro Gly Ala
 1 5 10 15

Ser Val Lys Leu Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
 20 25 30

Trp Ile Asn Trp Ile Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile
 35 40 45

Gly His Ile Ala Pro Gly Ser Gly Ser Thr Tyr Phe Asn Glu Met Phe
 50 55 60

Lys Gly Lys Ala Thr Leu Thr Val Asp Thr Ser Ser Ser Thr Ala Tyr
 65 70 75 80

Ile Gln Leu Ser Ser Leu Ser Ser Glu Asp Ser Ala Val Tyr Phe Cys

Ala Arg Ser Asp Ile Phe Leu Ser Tyr Ala Met Asp Tyr Trp Gly Gln
 100 105 110

Gly Thr Ser Val Thr Val Ser Ser
 115 120

<210> 9
 <211> 50
 <212> DNA
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> Forward oligonucleotide primer for a mutant IL13 sequence

<400> 9
 aagctttccc caggccctgt gcctccctct acagccctca ggaagctcat 50

<210> 10
 <211> 30
 <212> DNA
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> Reverse Oligo nucleotide primer of a mutant IL13 sequence

<400> 10
 ctcgagggttg aaccgtccct cgcgaaaaag 30

<210> 11
 <211> 22
 <212> DNA
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> Forward degenerate oligonucleotide primer for monkey IL13

<400> 11
 gyyctrggcy ycatggcgct yt 22

<210> 12
 <211> 25
 <212> DNA
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> Reverse degenerate oligonucleotide primer for monkey IL13

<400> 12
 tttcagttga accgtccyty gcgaa 25

<210> 13
 <211> 399
 <212> DNA

<213> *Macaca fascicularis*

<400> 13
atggcgctct tgttgaccat ggtcattgct ctcacttgcc tggcgggctt tgctcccca 60
agccctgtgc ctccctctac agccctcaag gagctcattg aggagctggt caacatcacc 120
cagaaccaga agggcccgct ctgcaatggc agcatgggtg ggagcatcaa cctgacagct 180
ggcgtgtact gtgcagccct ggaatccctg atcaacgtgt caggctgcag tgccatcgag 240
aagaccaga ggatgctgaa cggattctgc ccgcacaagg tctcagctgg gcagttttcc 300
agcttgctg tccgagacac caaaatcgag gtggcccagt ttgtaaagga cctgctcgta 360
catttaaaga aactttttcg caatggacgg ttcaactga 399

<210> 14
<211> 34
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
<223> Forward oligonucleotide primer for cynomologus monkey IL13

<400> 14
aagcttcacc atggcgctct tgttgaccat ggtc 34

<210> 15
<211> 40
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
<223> Reverse oligonucleotide primer for cynomologus monkey IL13

<400> 15
tcacaagatc tgggctcttc gaggttgaac cgtccattgc 40

<210> 16
<211> 23
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
<223> Forward oligonucleotide primer for Fc gamma1

<400> 16
ctcgaggagc ccagatcttg tga 23

<210> 17
<211> 35
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
<223> Reverse oligonucleotide primer for Fc gamma 1

<400> 17
gctctagagc ctcatttacc cggagacagg gagag

35

<210> 18
<211> 8
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> EPITOPE BINDING SITE

<400> 18

Glu Ser Leu Ile Asn Val Ser Gly
1 5

<210> 19
<211> 12
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> EPITOPE BINDING SITE

<400> 19

Tyr Cys Ala Ala Leu Glu Ser Leu Ile Asn Val Ser
1 5 10

<210> 20
<211> 23
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL1 228B/C-1

<400> 20

Asn Ile Val Leu Thr Gln Ser Pro Ala Ser Leu Ala Val Ser Leu Gly
1 5 10 15

Gln Arg Ala Thr Ile Ser Cys
20

<210> 21
<211> 23
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL1 TEMPLATE HT2

<400> 21

Asp Ile Val Met Thr Gln Ser Pro Asp Ser Leu Ser Val Ser Leu Gly
1 5 10 15

Glu Arg Ala Thr Ile Asn Cys
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<210> 22
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<220>
<223> FRL1 VARIANT B

<400> 22

Asp Ile Val Met Thr Gln Ser Pro Ala Ser Leu Ala Val Ser Leu Gly
1 5 10 15

Glu Arg Ala Thr Ile Asn Cys
20

<210> 23
<211> 23
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL1 VARIANT J

<400> 23

Asp Ile Val Leu Thr Gln Ser Pro Asp Ser Leu Ala Val Ser Leu Gly
1 5 10 15

Glu Arg Ala Thr Ile Asn Cys
20

<210> 24
<211> 23
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL1 VARIANT L

<400> 24

Asp Ile Val Leu Thr Gln Ser Pro Ala Ser Leu Ser Val Ser Leu Gly
1 5 10 15

Glu Arg Ala Thr Ile Asn Cys
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<210> 25
<211> 23

<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
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<400> 25

Asp Ile Val Leu Thr Gln Ser Pro Asp Ser Leu Ser Val Ser Leu Gly
1 5 10 15

Glu Arg Ala Thr Ile Asn Cys
20

<210> 26
<211> 23
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL1 VARIANT HT2-DP27 #29

<400> 26

Asp Ile Val Leu Thr Gln Ser Pro Val Ser Leu Ala Val Ser Leu Gly
1 5 10 15

Glu Arg Ala Thr Ile Asn Cys
20

<210> 27
<211> 23
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL1 VARIANT HT2-DP27 #53

<400> 27

Asp Ile Val Met Thr Gln Ser Pro Ala Ser Leu Ser Val Ser Leu Gly
1 5 10 15

Glu Arg Ala Thr Ile Asn Cys
20

<210> 28
<211> 23
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL1 VARIANT HT2-DP27 #66

<400> 28

Asp Ile Val Met Thr Gln Ser Pro Asp Ser Leu Ala Val Ser Leu Gly
 1 5 10 15

Glu Arg Ala Thr Ile Asn Cys
 20

<210> 29
 <211> 15
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> FRL2 228B/C

<400> 29

Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro Lys Leu Leu Ile Tyr
 1 5 10 15

<210> 30
 <211> 32
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> FRL3 288 B/C

<400> 30

Gly Val Pro Ala Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
 1 5 10 15

Leu Thr Ile Asp Pro Val Glu Ala Asp Asp Ala Ala Ser Tyr Tyr Cys
 20 25 30

<210> 31
 <211> 32
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> FRL3 HT2

<400> 31

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
 1 5 10 15

Leu Thr Ile Ser Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 32
 <211> 32
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>

<223> FRL3 VARIANT B

<400> 32

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Asp Pro Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 33

<211> 32

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRL3 VARIANT J

<400> 33

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Asp Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 34

<211> 32

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRL3 VARIANT L

<400> 34

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Asp Pro Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 35

<211> 32

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRL3 VARIANT N

<400> 35

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Asp Pro Val Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 36
 <211> 32
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> FRL3 VARIANT P

<400> 36

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
 1 5 10 15

Leu Thr Ile Asp Ser Val Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 37
 <211> 32
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> FRL3 VARIANT R

<400> 37

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
 1 5 10 15

Leu Thr Ile Ser Ser Val Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 38
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 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> FRL3 VARIANT HT2-NEW #1

<400> 38

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
 1 5 10 15

Leu Thr Ile Ser Pro Val Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 39
 <211> 32

<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL3 VARIANT HT2-NEW #9

<400> 39

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Ser Ser Val Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 40
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL3 VARIANT HT2-NEW #14

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Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Ser Pro Val Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 41
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL3 HT2-NEW #21

<400> 41

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Ser Ser Val Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 42
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL3 VARIANT HT2-NEW # 67

<400> 42

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
 1 5 10 15

Leu Thr Ile Asp Pro Leu Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 43
 <211> 32
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> FRL3 VARIANT HT2-NEW #74

<400> 43

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
 1 5 10 15

Leu Thr Ile Ser Pro Val Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 44
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 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> FRL3 VARIANT HT2-NEW #78

<400> 44

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
 1 5 10 15

Leu Thr Ile Asp Ser Val Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 45
 <211> 32
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> FRL3 VARIANT HT2-NEW #322

<400> 45

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
 1 5 10 15

Leu Thr Ile Asp Ser Leu Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 46
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL3 VARIANT HT2-NEW #162

<400> 46

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Asp Pro Val Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 47
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL3 VARIANT HT2-DP27 # 7

<400> 47

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Asp Ser Val Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 48
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL3 VARIANT HT2-DP27 #57

<400> 48

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Ser Pro Val Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 49
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL3 VARIANT HT2-DP27 #73

<400> 49

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Asp Pro Val Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 50

<211> 32

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRL3 VARIANT HT2-DP27 #92

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Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Asp Thr Val Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 51

<211> 32

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRL3 VARIANT HT2-DP27 #118

<400> 51

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Ser Pro Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 52

<211> 32

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRL3 VARIANT HT2-DP27 #123

<400> 52

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Ser Ser Leu Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 53
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL3 VARIANT HT2-DP27 #83

<400> 53

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Asp Pro Leu Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 54
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL3 VARIANT HT2-DP27 #135

<400> 54

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Ser Ser Leu Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 55
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRL3 VARIANT HT2-DP27 #273

<400> 55

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Ser Ser Val Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 56
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

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<223> FRL3 VARIANT HT2-DP27 #301

<400> 56

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Ser Pro Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 57

<211> 12

<212> PRT

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<220>

<223> FRL4 228 B/C

<400> 57

Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg Ala
1 5 10

<210> 58

<211> 11

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<220>

<223> FRL4 HT2

<400> 58

Phe Gly Gly Gly Thr Lys Val Glu Ile Lys Arg
1 5 10

<210> 59

<211> 11

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRL4 VARIANT B

<400> 59

Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
1 5 10

<210> 60

<211> 30

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRH1 228 B/C

<400> 60

Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu Val Ala Pro Ser Gln
1 5 10 15

Ser Leu Ser Ile Thr Cys Thr Val Ser Gly Phe Ser Leu Asn
20 25 30

<210> 61

<211> 30

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRH1 DP27

<400> 61

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Phe Ser Gly Phe Ser Leu Ser
20 25 30

<210> 62

<211> 30

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRH1 NEW

<400> 62

Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu Val Arg Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ser Thr Phe Ser
20 25 30

<210> 63

<211> 30

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRH1 VARIANT HT2-NEW #73

<400> 63

Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu Val Arg Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Ser Thr Phe Ser
20 25 30

<210> 64
<211> 30
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRH1 HT2-DP27 #7

<400> 64

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Val Ser Gly Phe Ser Leu Asn
20 25 30

<210> 65
<211> 30
<212> PRT
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<223> FRH1 VARIANT HT2-DP27 #40

<400> 65

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Val Ser Gly Phe Ser Leu Ser
20 25 30

<210> 66
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<223> FRH1 VARIANT HT2-DP27 #268

<400> 66

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Phe Ser Gly Phe Ser Leu Asn
20 25 30

<210> 67
<211> 14
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>

<223> FRH2 228 B/C

<400> 67

Trp Val Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Leu Gly
1 5 10

<210> 68

<211> 14

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRH2 DP27

<400> 68

Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu Ala
1 5 10

<210> 69

<211> 14

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<213> ARTIFICIAL SEQUENCE

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<223> FRH2 NEW

<400> 69

Trp Val Arg Gln Pro Pro Gly Arg Gly Leu Glu Trp Ile Gly
1 5 10

<210> 70

<211> 14

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<223> FRH2 VARIANT 1

<400> 70

Trp Val Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu Gly
1 5 10

<210> 71

<211> 14

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRH2 VARIANT 3

<400> 71

Trp Ile Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Leu Gly
1 5 10

<210> 72
<211> 14
<212> PRT
<213> ARTIFICIAL SEQUENCE

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<223> FRH2 VARIANT HT2-DP27 #7

<400> 72

Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu Gly
1 5 10

<210> 73
<211> 14
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRH2 VARIANT HT2-DP27 # 43

<400> 73

Trp Ile Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Leu Ala
1 5 10

<210> 74
<211> 14
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRH2 VARIANT HT2-DP27 #50

<400> 74

Trp Val Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Leu Ala
1 5 10

<210> 75
<211> 14
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRH2 VARIANT HT2-DP27 #100

<400> 75

Trp Val Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu Ala
1 5 10

<210> 76
<211> 32
<212> PRT
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<220>

<223> FRH3 228 B/C

<400> 76

Arg Leu Asn Ile Ser Lys Asp Ser Ser Lys Ser Gln Val Phe Leu Lys
1 5 10 15

Met Ser Ser Leu Gln Ser Asp Asp Thr Ala Arg Tyr Tyr Cys Ala Gly
20 25 30

<210> 77

<211> 32

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRH3 DP27

<400> 77

Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu Thr
1 5 10 15

Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala Arg
20 25 30

<210> 78

<211> 32

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRH3 NEW

<400> 78

Arg Val Thr Met Leu Lys Asp Thr Ser Lys Asn Gln Phe Ser Leu Arg
1 5 10 15

Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala Arg
20 25 30

<210> 79

<211> 32

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> FRH3 VARIANT 1

<400> 79

Arg Leu Thr Ile Ser Lys Asp Ser Ser Lys Asn Gln Val Val Leu Thr
1 5 10 15

Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala Gly
 20 25 30

<210> 80
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 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
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<400> 80

Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu Thr
 1 5 10 15

Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala Gly
 20 25 30

<210> 81
 <211> 32
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> FRH3 VARIANT 4

<400> 81

Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu Thr
 1 5 10 15

Met Thr Asn Met Asp Pro Val Asp Thr Ala Arg Tyr Tyr Cys Ala Gly
 20 25 30

<210> 82
 <211> 32
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> FRH3 HT2-NEW #1

<400> 82

Arg Leu Asn Met Ser Lys Asp Thr Ser Lys Asn Gln Phe Phe Leu Arg
 1 5 10 15

Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala Gly
 20 25 30

<210> 83
 <211> 32

<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRH3 VARIANT HT2-NEW #9

<400> 83

Arg Leu Asn Met Ser Lys Asp Thr Ser Lys Asn Gln Phe Phe Leu Arg
1 5 10 15

Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Arg Tyr Tyr Cys Ala Gly
20 25 30

<210> 84
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRH3 VARIANT HT2-NEW #14

<400> 84

Arg Val Asn Met Ser Lys Asp Thr Ser Lys Asn Gln Phe Ser Leu Arg
1 5 10 15

Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala Arg
20 25 30

<210> 85
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRH3 VARIANT HT2-DP27 #26

<400> 85

Arg Leu Asn Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu Thr
1 5 10 15

Met Thr Asn Met Asp Pro Val Asp Thr Ala Arg Tyr Tyr Cys Ala Arg
20 25 30

<210> 86
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRH3 VARIANT HT2-DP27 #275

<400> 86

Arg Leu Thr Ile Ser Lys Asp Ile Ser Lys Asn Gln Val Val Leu Thr
1 5 10 15

Met Thr Asn Met Asp Pro Val Asp Thr Ala Arg Tyr Tyr Cys Ala Gly
20 25 30

<210> 87
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRH3 VARIANT HT2-DP27 #301

<400> 87

Arg Leu Asn Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu Thr
1 5 10 15

Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala Gly
20 25 30

<210> 88
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRH3 VARIANT HT2-DP27 #580

<400> 88

Arg Leu Asn Ile Ser Lys Asp Ser Ser Lys Asn Gln Val Val Leu Thr
1 5 10 15

Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala Gly
20 25 30

<210> 89
<211> 32
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRH3 VARIANT HT2-DP27 #345

<400> 89

Arg Leu Asn Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu Thr
1 5 10 15

Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala Arg
20 25 30

<210> 90
<211> 32
<212> PRT
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<220>
<223> FRH3 VARIANT HT2-DP27 #634

<400> 90

Arg Leu Thr Ile Ser Lys Asp Ser Ser Lys Asn Gln Val Val Leu Thr
1 5 10 15

Met Thr Asn Met Asp Pro Val Asp Thr Ala Arg Tyr Tyr Cys Ala Gly
20 25 30

<210> 91
<211> 11
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> FRH4 228B/C

<400> 91

Trp Gly His Gly Thr Ser Val Thr Val Ser Ser
1 5 10

<210> 92
<211> 11
<212> PRT
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<223> FRH4 DP27

<400> 92

Trp Gly Gln Gly Ser Leu Val Thr Val Ser Ser
1 5 10

<210> 93
<211> 112
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> VARIABLE LIGHT CHAIN OF CL5

<400> 93

Asp Ile Val Met Thr Gln Ser Pro Asp Ser Leu Ser Val Ser Leu Gly
1 5 10 15

Glu Arg Ala Thr Ile Asn Cys Arg Ala Ser Lys Ser Val Asp Ser Tyr
20 25 30

Gly Gln Ser Phe Met His Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro
 35 40 45

Lys Leu Leu Ile Tyr Leu Ala Ser Asn Leu Glu Ser Gly Val Pro Asp
 50 55 60

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser
 65 70 75 80

Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys Gln Gln Asn Ala
 85 90 95

Glu Asp Pro Arg Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys Arg
 100 105 110

<210> 94

<211> 118

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> VARIABLE HEAVY CHAIN OF CL5

<400> 94

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
 1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Gly Ser Gly Phe Ser Leu Ser Ala Tyr
 20 25 30

Ser Val Asn Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu
 35 40 45

Ala Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys
 50 55 60

Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu
 65 70 75 80

Thr Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala
 85 90 95

Val Asp Gly Tyr Tyr Pro Tyr Ala Met Lys Asn Trp Gly Gln Gly Ser
 100 105 110

Leu Val Thr Val Ser Ser
 115

<210> 95
 <211> 112
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> VARIABLE LIGHT CHAIN OF CL-13

<400> 95

Asp Ile Val Met Thr Gln Ser Pro Asp Ser Leu Ser Val Ser Leu Gly
 1 5 10 15

Glu Arg Ala Thr Ile Asn Cys Arg Ala Ser Lys Ser Val Asp Ser Tyr
 20 25 30

Gly Gln Ser Phe Met His Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro
 35 40 45

Lys Leu Leu Ile Tyr Leu Ala Ser Asn Leu Glu Ser Gly Val Pro Asp
 50 55 60

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser
 65 70 75 80

Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys Gln Gln Asn Asn
 85 90 95

Glu Asp Pro Arg Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys Arg
 100 105 110

<210> 96
 <211> 118
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> VARIABLE HEAVY CHAIN OF CL-13

<400> 96

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
 1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Gly Ser Gly Phe Ser Leu Ser Ala Lys
 20 25 30

Ser Val Asn Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu
 35 40 45

Ala Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys
 50 55 60

Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu
 65 70 75 80

Thr Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala
 85 90 95

Val Asp Gly Tyr Tyr Pro Tyr Ala Met Ser Asn Trp Gly Gln Gly Ser
 100 105 110

Leu Val Thr Val Ser Ser
 115

<210> 97
 <211> 112
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> VARIABLE LIGHT CHAIN OF CL-50

<400> 97

Asp Ile Val Met Thr Gln Ser Pro Asp Ser Leu Ser Val Ser Leu Gly
 1 5 10 15

Glu Arg Ala Thr Ile Asn Cys Arg Ala Ser Lys Ser Val Asp Ser Tyr
 20 25 30

Gly Gln Ser Phe Met His Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro
 35 40 45

Lys Leu Leu Ile Tyr Leu Ala Ser Asn Leu Glu Ser Gly Val Pro Asp
 50 55 60

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser
 65 70 75 80

Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys Gln Gln Asn Ala
 85 90 95

Glu Asp Pro Arg Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys Arg
 100 105 110

<210> 98
 <211> 118
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>

<223> VARIABLE HEAVY CHAIN OF CL-50

<400> 98

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Gly Ser Gly Phe Ser Leu Ser Ala Lys
20 25 30

Ser Val Asn Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu
35 40 45

Ala Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys
50 55 60

Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu
65 70 75 80

Thr Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala
85 90 95

Val Asp Gly Tyr Tyr Pro Tyr Ala Met Lys Asn Trp Gly Gln Gly Ser
100 105 110

Leu Val Thr Val Ser Ser
115

<210> 99

<211> 15

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-L1 228B/C

<400> 99

Arg Ala Ser Lys Ser Val Asp Ser Tyr Gly Asn Ser Phe Met His
1 5 10 15

<210> 100

<211> 15

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-L1 VARIANT 1

<400> 100

Arg Ala Ser Lys Ser Val Asp Ser Tyr Gly Gln Ser Phe Met His
1 5 10 15

<210> 101
<211> 15
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-L1 VARIANT 2

<400> 101

Arg Ala Ser Lys Ser Val Asp Ser Tyr Gly Gln Ser Phe Leu His
1 5 10 15

<210> 102
<211> 15
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-L1 VARIANT 3

<400> 102

Arg Ala Ser Lys Ser Val Asp Ser Tyr Gly Asn Ser Tyr Met His
1 5 10 15

<210> 103
<211> 15
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-L1 VARIANT 4

<400> 103

Arg Ala Ser Lys Ser Val Asp Ser Tyr Gly Asn Ser Phe Leu His
1 5 10 15

<210> 104
<211> 7
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-L2 228B/C

<400> 104

Leu Ala Ser Asn Leu Glu Ser
1 5

<210> 105
<211> 7

<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-L2 VARIANT 1

<400> 105

Leu Ala Ser Asn Leu Asn Ser
1 5

<210> 106
<211> 7
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-L2 VARIANT 2

<400> 106

Leu Ala Ser Asn Leu Gln Ser
1 5

<210> 107
<211> 7
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-L2 VARIANT 3

<400> 107

Leu Ala Thr Asn Leu Glu Ser
1 5

<210> 108
<211> 7
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-L2 VARIANT 4

<400> 108

Leu Ala Ser Asn Leu Lys Ser
1 5

<210> 109
<211> 7
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-L2 VARIANT 5

<400> 109

Leu Ala Ser Asn Leu Glu Lys
1 5

<210> 110

<211> 7

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-L2 VARIANT 6

<400> 110

Leu Ala Ser Arg Leu Glu Ser
1 5

<210> 111

<211> 7

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-L2 VARIANT 7

<400> 111

Leu Ala Ser Asn Leu His Ser
1 5

<210> 112

<211> 7

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-L2 VARIANT 8

<400> 112

Leu Ala Ser Asn Leu Ser Ser
1 5

<210> 113

<211> 7

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-L2 VARIANT 9

<400> 113

Leu Ala Ser Phe Leu Glu Ser
1 5

<210> 114
<211> 7
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-L2 VARIANT 10

<400> 114

Leu Ala Asn Asn Leu Glu Ser
1 5

<210> 115
<211> 9
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-L3 228B/C

<400> 115

Gln Gln Asn Asn Glu Asp Pro Arg Thr
1 5

<210> 116
<211> 9
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-L3 VARIANT 1

<400> 116

Gln Gln Asn Ala Glu Asp Pro Arg Thr
1 5

<210> 117
<211> 5
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-H1 228B/C

<400> 117

Ala Tyr Ser Val Asn
1 5

<210> 118
<211> 5
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-H1 VARIANT 1

<400> 118

Ala Lys Ser Val Asn
1 5

<210> 119

<211> 5

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-H1 VARIANT 2

<400> 119

Ala Asn Ser Val Asn
1 5

<210> 120

<211> 5

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-H1 VARIANT 3

<400> 120

Gly Tyr Ser Val Asn
1 5

<210> 121

<211> 5

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-H1 VARIANT 4

<400> 121

Ala His Ser Val Asn
1 5

<210> 122

<211> 5

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-H1 VARIANT 5

<400> 122

Ala Arg Ser Val Asn
1 5

<210> 123
<211> 16
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-H2 228B/C

<400> 123

Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys Ser
1 5 10 15

<210> 124
<211> 16
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-H2 VARIANT 1

<400> 124

Met Ile Trp Gly Asp Gly Lys Ile Ser Tyr Asn Ser Ala Leu Lys Ser
1 5 10 15

<210> 125
<211> 16
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-H2 VARIANT 2

<400> 125

Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Glu Ser
1 5 10 15

<210> 126
<211> 16
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-H2 VARIANT 3

<400> 126

Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys Ser
1 5 10 15

<210> 127
<211> 16
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-H2 VARIANT 4

<400> 127

Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Asp Leu Lys Ser
1 5 10 15

<210> 128

<211> 16

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-H2 VARIANT 5

<400> 128

Met Ile Trp Gly Asp Gly Lys Val Val Tyr Asn Ser Ala Leu Lys Ser
1 5 10 15

<210> 129

<211> 16

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-H2 VARIANT 6

<400> 129

Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Glu Leu Lys Ser
1 5 10 15

<210> 130

<211> 16

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-H2 VARIANT 7

<400> 130

Met Ile Trp Gly Asp Gly Lys Ile Ala Tyr Asn Ser Ala Leu Lys Ser
1 5 10 15

<210> 131

<211> 16

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-H2 VARIANT 8

<400> 131

Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys Glu
 1 5 10 15

<210> 132
 <211> 16
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> CDR-H2 VARIANT 9

<400> 132

Met Val Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys Ser
 1 5 10 15

<210> 133
 <211> 16
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> CDR-H2 VARIANT 10

<400> 133

Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Ala Ser
 1 5 10 15

<210> 134
 <211> 16
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> CDR-H2 VARIANT 11

<400> 134

Met Ile Trp Gly Asp Gly Lys Lys Val Tyr Asn Ser Ala Leu Lys Ser
 1 5 10 15

<210> 135
 <211> 10
 <212> PRT
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> CDR-H3 228B/C

<400> 135

Asp Gly Tyr Tyr Pro Tyr Ala Met Asp Asn
 1 5 10

<210> 136
 <211> 10

<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-H3 VARIANT 1

<400> 136

Asp Gly Arg Tyr Pro Tyr Ala Met Asp Asn
1 5 10

<210> 137
<211> 10
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-H3 VARIANT 2

<400> 137

Asp Gly Tyr Tyr Pro Tyr Ala Met Lys Asn
1 5 10

<210> 138
<211> 10
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-H3 VARIANT 3

<400> 138

Asp Gly Arg Tyr Pro Tyr Ala Met Lys Asn
1 5 10

<210> 139
<211> 10
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-H3 VARIANT 4

<400> 139

Asp Gly Tyr Tyr Pro Tyr Ala Met Ser Asn
1 5 10

<210> 140
<211> 10
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> CDR-H3 VARIANT 5

<400> 140

Asp Gly Tyr Tyr Pro Tyr Ala Met Ala Asn
1 5 10

<210> 141

<211> 10

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> CDR-H3 VARIANT 6

<400> 141

Asp Gly Tyr Tyr Pro Tyr Ala Leu Asp Asn
1 5 10

<210> 142

<211> 112

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> VARIABLE LIGHT CHAIN OF CL-89

<400> 142

Asp Ile Val Met Thr Gln Ser Pro Asp Ser Leu Ser Val Ser Leu Gly
1 5 10 15

Glu Arg Ala Thr Ile Asn Cys Arg Ala Ser Lys Ser Val Asp Ser Tyr
20 25 30

Gly Asn Ser Phe Met His Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro
35 40 45

Lys Leu Leu Ile Tyr Leu Ala Ser Asn Leu Glu Ser Gly Val Pro Asp
50 55 60

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser
65 70 75 80

Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys Gln Gln Asn Asn
85 90 95

Glu Asp Pro Arg Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys Arg
100 105 110

<210> 143

<211> 118

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> VARIABLE HEAVY CHAIN CL-276G

<400> 143

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Val Ser Gly Phe Ser Leu Ser Ala Tyr
20 25 30

Ser Val Asn Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu
35 40 45

Ala Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys
50 55 60

Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu
65 70 75 80

Thr Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala
85 90 95

Gly Asp Gly Tyr Tyr Pro Tyr Ala Met Asp Asn Trp Gly Gln Gly Ser
100 105 110

Leu Val Thr Val Ser Ser
115

<210> 144

<211> 112

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> VARIABLE LIGHT CHAIN OF RL-36

<400> 144

Asp Ile Val Met Thr Gln Ser Pro Asp Ser Leu Ser Val Ser Leu Gly
1 5 10 15

Glu Arg Ala Thr Ile Asn Cys Arg Ala Ser Lys Ser Val Asp Ser Tyr
20 25 30

Gly Asn Ser Phe Met His Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro
35 40 45

Lys Leu Leu Ile Tyr Leu Ala Ser Asn Leu Glu Ser Gly Val Pro Asp
50 55 60

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser
65 70 75 80

Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys Gln Gln Asn Asn
85 90 95

Glu Asp Pro Arg Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys Arg
100 105 110

<210> 145

<211> 118

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> VARIABLE HEAVY CHAIN RL-36

<400> 145

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Gly Ser Gly Phe Ser Leu Ser Ala Tyr
20 25 30

Ser Val Asn Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu
35 40 45

Ala Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys
50 55 60

Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu
65 70 75 80

Thr Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala
85 90 95

Val Asp Gly Tyr Tyr Pro Tyr Ala Met Asp Asn Trp Gly Gln Gly Ser
100 105 110

Leu Val Thr Val Ser Ser
115

<210> 146

<211> 118

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> VARIABLE HEAVY CHAIN RL-19

<400> 146

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Ser Ser Gly Phe Ser Leu Ser Ala Tyr
20 25 30

Ser Val Asn Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu
35 40 45

Ala Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys
50 55 60

Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu
65 70 75 80

Thr Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala
85 90 95

Leu Asp Gly Tyr Tyr Pro Tyr Ala Met Asp Asn Trp Gly Gln Gly Ser
100 105 110

Leu Val Thr Val Ser Ser
115

<210> 147

<211> 118

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> VARIABLE HEAVY CHAIN RL-11

<400> 147

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Thr Ser Gly Phe Ser Leu Ser Ala Tyr
20 25 30

Ser Val Asn Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu
35 40 45

Ala Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys
50 55 60

Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu
65 70 75 80

Thr Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala
85 90 95

Val Asp Gly Tyr Tyr Pro Tyr Ala Met Asp Asn Trp Gly Gln Gly Ser
100 105 110

Leu Val Thr Val Ser Ser
115

<210> 148
<211> 118
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> VARIABLE HEAVY CHAIN RL-8

<400> 148

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Leu Ser Gly Phe Ser Leu Ser Ala Tyr
20 25 30

Ser Val Asn Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu
35 40 45

Ala Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys
50 55 60

Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu
65 70 75 80

Thr Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala
85 90 95

Ser Asp Gly Tyr Tyr Pro Tyr Ala Met Asp Asn Trp Gly Gln Gly Ser
100 105 110

Leu Val Thr Val Ser Ser
115

<210> 149
<211> 118
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>

<223> VARIABLE HEAVY CHAIN RL-45

<400> 149

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Thr Ser Gly Phe Ser Leu Ser Ala Tyr
20 25 30

Ser Val Asn Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu
35 40 45

Ala Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys
50 55 60

Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu
65 70 75 80

Thr Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala
85 90 95

Thr Asp Gly Tyr Tyr Pro Tyr Ala Met Asp Asn Trp Gly Gln Gly Ser
100 105 110

Leu Val Thr Val Ser Ser
115

<210> 150

<211> 112

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> VARIABLE LIGHT CHAIN RL-36-L1,59

<400> 150

Asp Ile Val Met Thr Gln Ser Pro Asp Ser Leu Ser Val Ser Leu Gly
1 5 10 15

Glu Arg Ala Thr Ile Asn Cys Arg Ala Ser Lys Ser Val Asp Ser Tyr
20 25 30

Gly Gln Ser Phe Met His Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro
35 40 45

Lys Leu Leu Ile Tyr Leu Ala Ser Asn Leu Glu Ser Gly Val Pro Asp
50 55 60

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser
65 70 75 80

Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys Gln Gln Asn Asn
85 90 95

Glu Asp Pro Arg Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys Arg
100 105 110

<210> 151
<211> 118
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> VARIABLE HEAVY CHAIN RL36-L1,59

<400> 151

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Gly Ser Gly Phe Ser Leu Ser Ala Tyr
20 25 30

Ser Val Asn Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu
35 40 45

Ala Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys
50 55 60

Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu
65 70 75 80

Thr Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala
85 90 95

Val Asp Gly Tyr Tyr Pro Tyr Ala Met Asp Asn Trp Gly Gln Gly Ser
100 105 110

Leu Val Thr Val Ser Ser
115

<210> 152
<211> 248
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>

<223> SINGLE CHAIN FV

<400> 152

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Val Ser Gly Phe Ser Leu Ser Ala Tyr
20 25 30

Ser Val Asn Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu
35 40 45

Ala Met Ile Trp Gly Asp Gly Lys Ile Val Tyr Asn Ser Ala Leu Lys
50 55 60

Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu
65 70 75 80

Thr Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr Cys Ala
85 90 95

Gly Asp Gly Tyr Tyr Pro Tyr Ala Met Asp Asn Trp Gly Gln Gly Ser
100 105 110

Leu Val Thr Val Ser Ser Gly Gly Ser Ser Arg Ser Ser Ser Ser Gly
115 120 125

Gly Gly Gly Ser Gly Gly Gly Gly Asp Ile Val Met Thr Gln Ser Pro
130 135 140

Asp Ser Leu Ser Val Ser Leu Gly Glu Arg Ala Thr Ile Asn Cys Arg
145 150 155 160

Ala Ser Lys Ser Val Asp Ser Tyr Gly Asn Ser Phe Met His Trp Tyr
165 170 175

Gln Gln Lys Pro Gly Gln Pro Pro Lys Leu Leu Ile Tyr Leu Ala Ser
180 185 190

Asn Leu Glu Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly
195 200 205

Thr Asp Phe Thr Leu Thr Ile Ser Ser Val Gln Ala Glu Asp Val Ala
210 215 220

Val Tyr Tyr Cys Gln Gln Asn Asn Glu Asp Pro Arg Thr Phe Gly Gly
225 230 235 240

Gly Thr Lys Val Glu Ile Lys Arg
245

<210> 153
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> FRL1 VARIANT N

<400> 153
Asp Ile Val Leu Thr Gln Ser Pro Ala Ser Leu Ala Val Ser Leu Gly
1 5 10 15
Glu Arg Ala Thr Ile Asn Cys
20

<210> 154
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> FRL1 VARIANT HT2-DP27 #118

<400> 154
Asp Ile Val Leu Thr Gln Ser Pro Ala Ser Leu Ala Val Ser Leu Gly
1 5 10 15
Glu Arg Ala Thr Ile Asn Cys
20

<210> 155
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> FRL3 VARIANT HT2-dp27 #40

<400> 155
Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
1 5 10 15
Leu Thr Ile Asp Ser Val Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 156
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> FRL3 VARIANT HT2-dp27 #26

<400> 156
 Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
 1 5 10 15
 Leu Thr Ile Asp Pro Val Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 157
 <211> 32
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> FRL3 VARIANT HT2-dp27 #164

<400> 157
 Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
 1 5 10 15
 Leu Thr Ile Ser Pro Leu Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 158
 <211> 32
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> FRL3 VARIANT HT2-dp27 #304

<400> 158
 Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
 1 5 10 15
 Leu Thr Ile Asp Ser Val Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 159
 <211> 32
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> FRL3 VARIANT HT2-dp27 #274

<400> 159
 Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
 1 5 10 15
 Leu Thr Ile Asp Pro Val Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 160
 <211> 32
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> FRL3 VARIANT HT2-dp27 #530

<400> 160
 Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
 1 5 10 15
 Leu Thr Ile Ser Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 161
 <211> 32
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> FRL3 VARIANT HT2-dp27 #374

<400> 161
 Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Arg Thr Asp Phe Thr
 1 5 10 15
 Leu Thr Ile Asp Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 162
 <211> 32
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> FRL3 VARIANT HT2-dp27 #610

<400> 162
 Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
 1 5 10 15
 Leu Thr Ile Asp Ser Leu Glu Ala Glu Asp Val Ala Val Tyr Tyr Cys
 20 25 30

<210> 163
 <211> 14
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> FRH2 Variant HT2-NEW #14

<400> 163
 Trp Val Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Ile Gly
 1 5 10

<210> 164
 <211> 14
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> FRH2 Variant HT2-NEW #67

<400> 164
 Trp Val Arg Gln Pro Pro Gly Arg Gly Leu Glu Trp Leu Gly
 1 5 10

<210> 165
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> FRH3 Variant HT2-NEW #17

<400> 165
Arg Leu Asn Met Ser Lys Asp Thr Ser Lys Asn Gln Phe Ser Leu Arg
1 5 10 15
Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala Gly
20 25 30

<210> 166
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> FRH3 Variant HT2-NEW #65

<400> 166
Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Phe Ser Leu Arg
1 5 10 15
Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Arg Tyr Tyr Cys Ala Gly
20 25 30

<210> 167
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> FRH3 Variant HT2-NEW #67

<400> 167
Arg Val Asn Met Ser Lys Asp Thr Ser Lys Asn Gln Phe Ser Leu Arg
1 5 10 15
Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Arg Tyr Tyr Cys Ala Gly
20 25 30

<210> 168
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> FRH3 Variant HT2-NEW #73

<400> 168
Arg Val Thr Met Leu Lys Asp Thr Ser Lys Asn Gln Phe Ser Leu Arg
1 5 10 15
Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala Gly
20 25 30

<210> 169
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> FRH3 Variant HT2-NEW #74

<400> 169
Arg Val Thr Ile Leu Lys Asp Thr Ser Lys Asn Gln Phe Ser Leu Arg
1 5 10 15
Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Arg Tyr Tyr Cys Ala Gly
20 25 30

<210> 170
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223>FRH3 Variant HT2-NEW #78

<400> 170
Arg Val Asn Ile Leu Lys Asp Thr Ser Lys Asn Gln Phe Ser Leu Arg
1 5 10 15
Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala Gly
20 25 30

<210> 171
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> FRH3 Variant HT2-NEW #275

<400> 171
Arg Val Asn Ile Leu Lys Asp Thr Ser Lys Asn Gln Phe Phe Leu Arg
1 5 10 15
Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Arg Tyr Tyr Cys Ala Gly
20 25 30

<210> 172
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> FRH3 Variant HT2-NEW #284

<400> 172
Arg Leu Ile Ile Ser Lys Asp Thr Ser Lys Asn Gln Phe Ser Leu Arg
1 5 10 15
Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala Gly
20 25 30

<210> 173
<211> 32

<212> PRT
 <213> Artificial Sequence

 <220>
 <223> FRH3 Variant HT2-NEW #291

 <400> 173
 Arg Leu Thr Ile Leu Lys Asp Thr Ser Lys Asn Gln Phe Phe Leu Arg
 1 5 10 15
 Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala Gly
 20 25 30

 <210> 174
 <211> 32
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> FRH3 Variant HT2-NEW #300

 <400> 174
 Arg Val Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Phe Ser Leu Arg
 1 5 10 15
 Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala Gly
 20 25 30

 <210> 175
 <211> 32
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> FRH3 Variant HT2-NEW #302

 <400> 175
 Arg Val Asn Met Ser Lys Asp Thr Ser Lys Asn Gln Phe Ser Leu Arg
 1 5 10 15
 Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala Gly
 20 25 30

 <210> 176
 <211> 32
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> FRH3 Variant HT2-NEW #322

 <400> 176
 Arg Val Asn Ile Ser Lys Asp Thr Ser Lys Asn Gln Phe Phe Leu Arg
 1 5 10 15
 Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Arg Tyr Tyr Cys Ala Gly
 20 25 30

 <210> 177
 <211> 32
 <212> PRT
 <213> Artificial Sequence

<220>

<223> FRH3 Variant HT2-NEW #111

<400> 177

Arg	Leu	Thr	Ile	Ser	Lys	Asp	Thr	Ser	Lys	Asn	Gln	Phe	Phe	Leu	Arg
1				5				10						15	
Leu	Ser	Ser	Val	Thr	Ala	Ala	Asp	Thr	Ala	Arg	Tyr	Tyr	Cys	Ala	Gly
			20					25					30		

<210> 178

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

<223> FRH3 Variant HT2-NEW #162

<400> 178

Arg	Leu	Thr	Met	Ser	Lys	Asp	Thr	Ser	Lys	Asn	Gln	Phe	Ser	Leu	Arg
1				5				10						15	
Leu	Ser	Ser	Val	Thr	Ala	Ala	Asp	Thr	Ala	Val	Tyr	Tyr	Cys	Ala	Gly
			20					25					30		

<210> 179

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

<223> FRH3 Variant HT2-NEW #139

<400> 179

Arg	Val	Thr	Met	Ser	Lys	Asp	Thr	Ser	Lys	Asn	Gln	Phe	Phe	Leu	Arg
1				5				10						15	
Leu	Ser	Ser	Val	Thr	Ala	Ala	Asp	Thr	Ala	Arg	Tyr	Tyr	Cys	Ala	Gly
			20					25					30		

<210> 180

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

<223> FRH3 Variant HT2-NEW #177

<400> 180

Arg	Val	Thr	Met	Ser	Lys	Asp	Thr	Ser	Lys	Asn	Gln	Phe	Ser	Leu	Arg
1				5				10						15	
Leu	Ser	Ser	Val	Thr	Ala	Ala	Asp	Thr	Ala	Val	Tyr	Tyr	Cys	Ala	Gly
			20					25					30		

<210> 181

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> FRH4 variant HT2-dp27 #19

<400> 181

Trp Gly His Gly Ser Leu Val Thr Val Ser Ser
1 5 10

<210> 182

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

<223> FRH3 variant HT2-dp27 #19

<400> 182

Arg Leu Asn Ile Ser Lys Asp Ser Ser Lys Asn Gln Val Val Leu Thr
1 5 10 15
Met Thr Asn Met Asp Pro Val Asp Thr Ala Arg Tyr Tyr Cys Ala Gly
20 25 30

<210> 183

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

<223> FRH3 variant HT2-dp27 #43

<400> 183

Arg Leu Asn Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu Thr
1 5 10 15
Met Thr Asn Met Asp Pro Val Asp Thr Ala Arg Tyr Tyr Cys Ala Gly
20 25 30

<210> 184

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

<223> FRH3 variant HT2-dp27 #118

<400> 184

Arg Leu Thr Ile Ser Lys Asp Ile Ser Lys Asn Gln Val Val Leu Thr
1 5 10 15
Met Thr Asn Met Asp Pro Val Asp Thr Ala Arg Tyr Tyr Cys Ala Gly
20 25 30

<210> 185

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H1 Cl-65 Variant

<400> 185

Ala Ser Ser Val Asn
 1 5

<210> 186
 <211> 131
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Majority sequence of aligned IL-13 of various species

<400> 186
 Met Ala Leu Trp Leu Thr Ala Val Ile Ala Leu Ala Cys Leu Gly Gly
 1 5 10 15
 Leu Ala Ser Pro Gly Pro Val Pro Pro Ser Thr Ala Leu Lys Glu Leu
 20 25 30
 Ile Glu Glu Leu Val Asn Ile Thr Gln Asn Gln Lys Ala Pro Leu Cys
 35 40 45
 Asn Gly Ser Met Val Trp Ser Val Asn Leu Thr Ala Gly Gly Tyr Cys
 50 55 60
 Ala Ala Leu Glu Ser Leu Ile Asn Ile Ser Gly Cys Ser Ala Ile Gln
 65 70 75 80
 Arg Thr Gln Arg Met Leu Asn Gly Leu Cys Pro His Lys Ala Ser Ala
 85 90 95
 Gly Gln Ser Ser Ser Arg Val Arg Asp Thr Lys Ile Glu Val Ala Gln
 100 105 110
 Phe Val Lys Asp Leu Leu Asn Tyr Ser Lys Gln Leu Phe Arg Asn Gly
 115 120 125
 Arg Phe Asn
 130

<210> 187
 <211> 132
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Human interleukin-13 sequence

<400> 187
 Met Ala Leu Leu Leu Thr Thr Val Ile Ala Leu Thr Cys Leu Gly Gly
 1 5 10 15
 Phe Ala Ser Pro Gly Pro Val Pro Pro Ser Thr Ala Leu Arg Glu Leu
 20 25 30
 Ile Glu Glu Leu Val Asn Ile Thr Gln Asn Gln Lys Ala Pro Leu Cys
 35 40 45
 Asn Gly Ser Met Val Trp Ser Ile Asn Leu Thr Ala Gly Met Tyr Cys
 50 55 60
 Ala Ala Leu Glu Ser Leu Ile Asn Val Ser Gly Cys Ser Ala Ile Glu
 65 70 75 80
 Lys Thr Gln Arg Met Leu Ser Gly Phe Cys Pro His Lys Val Ser Ala
 85 90 95
 Gly Gln Phe Ser Ser Leu His Val Arg Asp Thr Lys Ile Glu Val Ala
 100 105 110
 Gln Phe Val Lys Asp Leu Leu Leu His Leu Lys Lys Leu Phe Arg Glu
 115 120 125
 Gly Arg Phe Asn
 130

<210> 188
 <211> 132
 <212> PRT
 <213> Macaque

<220>
 <223> Monkey interleukin-13 sequence

<400> 188
 Met Ala Leu Leu Thr Met Val Ile Ala Leu Thr Cys Leu Gly Gly
 1 5 10 15
 Phe Ala Ser Pro Ser Pro Val Pro Pro Ser Thr Ala Leu Lys Glu Leu
 20 25 30
 Ile Glu Glu Leu Val Asn Ile Thr Gln Asn Gln Lys Ala Pro Leu Cys
 35 40 45
 Asn Gly Ser Met Val Trp Ser Ile Asn Leu Thr Ala Gly Val Tyr Cys
 50 55 60
 Ala Ala Leu Glu Ser Leu Ile Asn Val Ser Gly Cys Ser Ala Ile Glu
 65 70 75 80
 Lys Thr Gln Arg Met Leu Asn Gly Phe Cys Pro His Lys Val Ser Ala
 85 90 95
 Gly Gln Phe Ser Ser Leu Arg Val Arg Asp Thr Lys Ile Glu Val Ala
 100 105 110
 Gln Phe Val Lys Asp Leu Leu Val His Leu Lys Lys Leu Phe Arg Asn
 115 120 125
 Gly Arg Phe Asn
 130

<210> 189
 <211> 132
 <212> PRT
 <213> Bovine

<220>
 <223> Cow interleukin-13 sequence

<400> 189
 Met Ala Leu Leu Leu Thr Ala Val Ile Val Leu Ile Cys Phe Gly Gly
 1 5 10 15
 Leu Thr Ser Pro Ser Pro Val Pro Ser Ala Thr Ala Leu Lys Glu Leu
 20 25 30
 Ile Glu Glu Leu Val Asn Ile Thr Gln Asn Gln Lys Val Pro Leu Cys
 35 40 45
 Asn Gly Ser Met Val Trp Ser Leu Asn Leu Thr Ser Ser Met Tyr Cys
 50 55 60
 Ala Ala Leu Asp Ser Leu Ile Ser Ile Ser Asn Cys Ser Val Ile Gln
 65 70 75 80
 Arg Thr Lys Lys Met Leu Asn Ala Leu Cys Pro His Lys Pro Ser Ala
 85 90 95
 Lys Gln Val Ser Ser Glu Tyr Val Arg Asp Thr Lys Ile Glu Val Ala
 100 105 110
 Gln Phe Leu Lys Asp Leu Leu Arg His Ser Arg Ile Val Phe Arg Asn
 115 120 125
 Glu Arg Phe Asn
 130

<210> 190
 <211> 131
 <212> PRT
 <213> Canis C. lupus

<220>

<223> Dog interleukin-13 sequence

<400> 190

```
Met Ala Leu Trp Leu Thr Val Val Ile Ala Leu Thr Cys Leu Gly Gly
 1          5          10          15
Leu Ala Ser Pro Ser Pro Val Thr Pro Ser Pro Thr Leu Lys Glu Leu
 20          25          30
Ile Glu Glu Leu Val Asn Ile Thr Gln Asn Gln Ala Ser Leu Cys Asn
 35          40          45
Gly Ser Met Val Trp Ser Val Asn Leu Thr Ala Gly Met Tyr Cys Ala
 50          55          60
Ala Leu Glu Ser Leu Ile Asn Val Ser Asp Cys Ser Ala Ile Gln Arg
 65          70          75          80
Thr Gln Arg Met Leu Lys Ala Leu Cys Ser Gln Lys Pro Ala Ala Gly
 85          90          95
Gln Ile Ser Ser Glu Arg Ser Arg Asp Thr Lys Ile Glu Val Ile Gln
100          105          110
Leu Val Lys Asn Leu Leu Thr Tyr Val Arg Gly Val Tyr Arg His Gly
115          120          125
Asn Phe Arg
130
```

<210> 191

<211> 131

<212> PRT

<213> Rat

<220>

<223> Rat interleukin-13 sequence

<400> 191

```
Met Ala Leu Trp Val Thr Ala Val Leu Ala Leu Ala Cys Leu Gly Gly
 1          5          10          15
Leu Ala Thr Pro Gly Pro Val Arg Arg Ser Thr Ser Pro Pro Val Ala
 20          25          30
Leu Arg Glu Leu Ile Glu Glu Leu Ser Asn Ile Thr Gln Asp Gln Lys
 35          40          45
Thr Ser Leu Cys Asn Ser Ser Met Val Trp Ser Val Asp Leu Thr Ala
 50          55          60
Gly Gly Phe Cys Ala Ala Leu Glu Ser Leu Thr Asn Ile Ser Ser Cys
 65          70          75          80
Asn Ala Ile His Arg Thr Gln Arg Ile Leu Asn Gly Leu Cys Asn Gln
 85          90          95
Lys Ala Ser Asp Val Ala Ser Ser Pro Pro Asp Thr Lys Ile Glu Val
100          105          110
Ala Gln Phe Ile Ser Lys Leu Leu Asn Tyr Ser Lys Gln Leu Phe Arg
115          120          125
Tyr Gly His
130
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<210> 192

<211> 131

<212> PRT

<213> Mus Musculus

<220>

<223> Mouse interleukin-13 sequence

<400> 192

```
Met Ala Leu Trp Val Thr Ala Val Leu Ala Leu Ala Cys Leu Gly Gly
 1          5          10          15
Leu Ala Ala Pro Gly Pro Val Pro Arg Ser Val Ser Leu Pro Leu Thr
 20          25          30
Leu Lys Glu Leu Ile Glu Glu Leu Ser Asn Ile Thr Gln Asp Gln Thr
 35          40          45
Pro Leu Cys Asn Gly Ser Met Val Trp Ser Val Asp Leu Ala Ala Gly
 50          55          60
Gly Phe Cys Val Ala Leu Asp Ser Leu Thr Asn Ile Ser Asn Cys Asn
 65          70          75          80
Ala Ile Tyr Arg Thr Gln Arg Ile Leu His Gly Leu Cys Asn Arg Lys
 85          90          95
Ala Pro Thr Thr Val Ser Ser Leu Pro Asp Thr Lys Ile Glu Val Ala
100          105          110
His Phe Ile Thr Lys Leu Leu Ser Tyr Thr Lys Gln Leu Phe Arg His
115          120          125
Gly Pro Phe
130
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<210> 193

<211> 125

<212> PRT

<213> Meriones (rodent)

<220>

<223> Gerbil interleukin-13 sequence

<400> 193

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Met Ala Leu Trp Leu Thr Ala Val Leu Ala Leu Ala Cys Leu Ser Gly
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Leu Ala Val Pro Gly Pro Val Gly Arg Ser Val Ser Pro Pro Val Ala
 20          25          30
Leu Lys Glu Leu Ile Glu Glu Leu Ser Asn Ile Thr Gln Asp Gln Arg
 35          40          45
Thr Pro Leu Cys Asn Gly Ser Met Val Trp Ser Val Asp Leu Ala Ala
 50          55          60
Gly Gly Phe Cys Ala Ala Leu Asp Ser Leu Thr Asn Ile Ser Ser Cys
 65          70          75          80
Asn Thr Ile Gln Lys Thr Gln Arg Ile Leu Asn Gly Leu Cys Ala Arg
 85          90          95
Lys Ala Pro Ala Val Val Ser Arg Val Pro Asp Thr Lys Ile Glu Ala
100          105          110
Ala Gln Phe Ile Lys Asn Leu Leu Asn Tyr Ser Lys Gln
115          120          125
```